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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,725	03/18/2004	Pei-Chung Wang	GP-302676	2760

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EXAMINER	
BEVERIDGE, RACHEL E	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 05/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/720,725	WANG ET AL.	
	Examiner	Art Unit	
	Rachel E. Beveridge	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on March 31, 2006. These drawings are acceptable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-6, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al. (US 3,219,789) in view of Morris et al. (US 3,197,611).

With respect to claims 1-2, 4-6, and 11-12, Branch discloses his invention relating to welding with particular regard to the formation of the weld root in an arc welding process (Branch et al., col. 1, lines 9-11). Branch discloses a vessel (10) of circular cross-section with opposing cylindrical segments (11,12), which are identically formed at their adjoining ends to define a circular joint (13) (col. 1, lines 49-52). See figure 1. Branch teaches arranging the welding apparatus with the welding tool (15) closely overlying the supported vessel (10) and the shielding head (46) directly below the weld area at the highest portion of the joint (13) and is opposite of the welding tool (15) (col. 3, lines 33-38). See figure 1. Branch discloses rotatably and slidably mounting a body (37) onto a support rod (25) within a vessel (10), with a portion of the

body transverse to the plane of the joint (13) (col. 2, lines 55-58). Branch discloses holding the body (37) in a selected position so that the shielding gas follows a path beginning at the inlet of the support rod (25) with a gas filled passage (33), and terminates at the outlet of the cup-shaped head (46) (col. 2, lines 58-70). See figures 1 and 3. Furthermore, Branch teaches that the parts are arranged so that "gas under pressure is permitted to flow from passage (33) through port (42) to chamber (41) and then by communicating connections through flexible tube (44) to head (46) where it is free to discharge as a directed stream through porous cover (47) directly upon the inner surface of joint (13)" (col. 3, lines 22-28). Branch discloses progressively forming the weld around the vessel (10) (col. 3, line 43). However, Branch lacks disclosure of the flexible tubing comprising a plurality of rings. Morris discloses a casing (1) formed by a corrugated tube of metal which may be bent repeatedly without great effort, yet will hold a position against the forces of normal use (Morris et al., col. 2, lines 5-9). Morris also discloses an alternative embodiment in which the tube is corrugated in a bellows-like form and made of a malleable material such as brass (see figure 3, for "rings" of the flexible tube) (col. 2, lines 17-20). Furthermore, Morris discloses ferrules (10,11) at each end of the corrugated tubing (col. 2, lines 11-12); thus, it is obvious that there are two ends of the corrugated structure which would lead to a terminal ring towards the weld area and a terminal ring at the inlet of the gas stream. Morris teaches cooling gas passing through the tubing and ferrule (10) to the point of welding, see figures 7-19 (col. 2, lines 63-67). Morris discloses the flexible tubes ability to provide the necessary electrode wire guidance and gas delivery functions required for the welding operation

(col. 1, lines 44-46). Furthermore, Morris discloses the passage of inert gas through the casing (1) and out at (10) toward the point of welding, blanketing the point (col. 3, lines 13-16). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17).

Regarding claims 13-14, Branch shows an upperside and underside of the vessel (10) assembly in figure 1. The upperside being the outside of the vessel (10), and the underside being the inside of the vessel (10). Branch discloses his invention relating to welding with particular regard to the formation of the weld root in an arc welding process (Branch et al., col. 1, lines 9-11). Branch discloses a vessel (10) of circular cross-section with opposing cylindrical segments (11,12), which are identically formed at their adjoining ends to define a circular joint (13) (col. 1, lines 49-52). See figure 1. Branch teaches arranging the welding apparatus with the welding tool (15) closely overlying the supported vessel (10) and the shielding head (46) directly below the weld area at the highest portion of the joint (13) and is opposite of the welding tool (15) (col. 3, lines 33-38). See figure 1. The shielding gas follows a path beginning at the inlet of the support rod (25) with a gas filled passage (33), and terminates at the outlet of the cup-shaped head (46) (col. 2, lines 62-70). See figures 1 and 3. Furthermore, Branch teaches that the parts are arranged so that "gas under pressure is permitted to flow from passage (33) through port (42) to chamber (41) and then by communicating connections through flexible tube (44) to head (46) where it is free to discharge as a directed stream through

porous cover (47) directly upon the inner surface of joint (13)" (col. 3, lines 22-28). Branch discloses progressively forming the weld around the vessel (10) (col. 3, line 43). However, Branch lacks disclosure of the flexible tubing comprising a plurality of rings. Morris discloses a casing (1) formed by a corrugated tube of metal which may be bent repeatedly without great effort, yet will hold a position against the forces of normal use (Morris et al., col. 2, lines 5-9). Morris also discloses an alternative embodiment in which the tube is corrugated in a bellows-like form and made of a malleable material such as brass (see figure 3, for "rings" of the flexible tube) (col. 2, lines 17-20). Furthermore, Morris discloses ferrules (10,11) at each end of the corrugated tubing (col. 2, lines 11-12); thus, it is obvious that there are two ends of the corrugated structure which would lead to a terminal ring towards the weld area and a terminal ring at the inlet of the gas stream. Morris teaches cooling gas passing through the tubing and ferrule (10) to the point of welding, see figures 7-19 (col. 2, lines 63-67). Morris discloses the flexible tubes ability to provide the necessary electrode wire guidance and gas delivery functions required for the welding operation (col. 1, lines 44-46). Furthermore, Morris discloses the passage of inert gas through the casing (1) and out at (10) toward the point of welding, blanketing the point (col. 3, lines 13-16). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17).

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al. (US 3,219,789) and Morris et al. (US 3,197,611) as applied to claim 1 above, and further in view of Corby, Jr. et al. (US 4,532,405).

Branch teaches arranging the welding apparatus with the welding tool (15) closely overlying the supported vessel (10) and the shielding head (46) directly below the weld area at the highest portion of the joint (13) and is opposite of the welding tool (15) (col. 3, lines 33-38). See figure 1. The shielding gas follows a path beginning at the inlet of the support rod (25) with a gas filled passage (33), and terminates at the outlet of the cup-shaped head (46) (col. 2, lines 62-70). See figures 1 and 3. Furthermore, Branch teaches that the parts are arranged so that "gas under pressure is permitted to flow from passage (33) through port (42) to chamber (41) and then by communicating connections through flexible tube (44) to head (46) where it is free to discharge as a directed stream through porous cover (47) directly upon the inner surface of joint (13)" (col. 3, lines 22-28). Branch discloses progressively forming the weld around the vessel (10) (col. 3, line 43). Branch does not disclose visual signals from an optical element on the terminal pivot ring of the tubular device used for directing shielding gas at the underside of the weld site. However, Morris discloses the privot ring structure as previously discussed and Corby illustrates optical cables for transporting visual signals from the terminus of a welding device in figure 1. Corby also discloses that these cables are "flexible coherent fiber optic bundles" (Abstract, lines 3-4). Furthermore, Corby states that an image of the weld puddle is used as feedback information to change the position of the optical systems (Abstract, lines 8-14). Corby

also discloses the optical system (38) comprised of a lens (43) and end face of a fiber optic bundle (23) (col. 3, lines 36-38). Corby discloses that the weld seam is viewed by a central opening (40) in the torch body (24) (col. 3, lines 29-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17), and further to modify the combined invention of Branch and Morris with the addition of the optical signals of Corby in order to optimize the gas metal arc welding device by detecting "weld puddle characteristics and seam to puddle deviation" (Corby, Jr. et al., column 1, lines 30-37).

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al. (US 3,219,789) and Morris et al. (US 3,197,611) as applied to claim 1 above, and further in view of Berg et al. (US 6,888,972 B2).

With respect to claims 9-10, Branch does not disclose temperature sensors from the terminus of the tubular device used for directing shielding gas at the underside of the weld site. However, Berg discloses TIG welding of cylindrical structures with fibers present (Column 19, lines 60-62). Berg states that precautions should be taken to ensure that the heat generated during the welding process does not damage the fibers (Column 20, lines 7-11). Berg also discloses TIG welding that is "confined between the weld and the base metal at the point of fusion so that a narrow heat affected zone is produced" (Column 20, lines 13-16). Furthermore, Berg discloses the temperature

sensors for welding directed to "a multiple component sensor mechanism capable of being pre-assembled and used in numerous applications and environments" (Column 22, lines 39-42). Berg also states the fiber optic sensors to be located where near the "sensitive" portion so that the fiber optic wraps are modulated to detect an event of interest (col. 23, lines 1-3 and 12-15) (therefore, the sensors are "responsive" to heat changes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17), and further to modify the combined welding method of Branch and Morris by adding the temperature measurements of Berg in order to ensure that the assembly process does not sink too much heat leading to a poorer weld joint or too little heat damaging the optical fibers (Berg et al., column 19, lines 62-67).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al. (US 3,219,789) and Morris et al. (US 3,197,611) as applied to claim 14 above, and further in view of Corby, Jr. et al. (US 4,532,405).

Branch does not disclose visual signals from the terminus of the tubular device used for directing shielding gas at the underside of the weld site. However, Corby illustrates optical cables for transporting visual signals from the terminus of a welding device in figure 1. Corby also discloses that these cables are "flexible coherent fiber optic bundles" (Abstract, lines 3-4). Furthermore, Corby states that an image of the

weld puddle is used as feedback information to change the position of the optical systems (Abstract, lines 8-14). Corby also discloses the optical system (38) comprised of a lens (43) and end face of a fiber optic bundle (23) (col. 3, lines 36-38). Corby discloses that the weld seam is viewed by a central opening (40) in the torch body (24) (col. 3, lines 29-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17), and further to modify the combined invention of Branch and Morris with the addition of the optical signals of Corby in order to optimize the gas metal arc welding device by detecting "weld puddle characteristics and seam to puddle deviation" (Corby, Jr. et al., column 1, lines 30-37).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al. (US 3,219,789) and Morris et al. (US 3,197,611) as applied to claim 13 above, and further in view of Berg et al. (US 6,888,972 B2).

Branch does not disclose temperature sensors from the terminus of the tubular device used for directing shielding gas at the underside of the weld site. However, Berg discloses TIG welding of cylindrical structures with fibers present (Column 19, lines 60-62). Berg states that precautions should be taken to ensure that the heat generated during the welding process does not damage the fibers (Column 20, lines 7-11). Berg also discloses TIG welding that is "confined between the weld and the base metal at the

point of fusion so that a narrow heat affected zone is produced" (Column 20, lines 13-16). Furthermore, Berg discloses the temperature sensors for welding directed to "a multiple component sensor mechanism capable of being pre-assembled and used in numerous applications and environments" (Column 22, lines 39-42). Berg also states the fiber optic sensors to be located where near the "sensitive" portion so that the fiber optic wraps are modulated to detect an event of interest (col. 23, lines 1-3 and 12-15) (therefore, the sensors are "responsive" to heat changes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Branch to include the corrugated rings of Morris in order to maintain the actuated positioning of the welding torch and tubing by resisting any internal tendency to straighten out (Morris et al., col. 2, lines 15-17), and further to modify the combined welding method of Branch and Morris by adding the temperature measurements of Berg in order to ensure that the assembly process does not sink too much heat leading to a poorer weld joint or too little heat damaging the optical fibers (Berg et al., column 19, lines 62-67).

Response to Arguments

Applicant's arguments with respect to claims 1-16 (pages 6-8) have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues Branch does not disclose a tubular device having a plurality of pivot rings and does not suggest articulating the tubular device by pivoting one of the

pivot rings. The examiner agrees; however, Morris et al. discloses this feature and in combination with Branch satisfies the claim limitations.

Applicant argues the rejection of claims 7 and 15 fail to explain how a person of ordinary skill in the art would modify Branch to be "responsive to said visual signals" (page 6 and 7). The examiner disagrees and reminds applicant that Corby illustrates optical cables for transporting visual signals from the terminus of a welding device in figure 1. Corby also discloses that these cables are "flexible coherent fiber optic bundles" (Corby et al., abstract, lines 3-4) and states that an image of the weld puddle is used as feedback information to change the position of the optical systems (Abstract, lines 8-14). Furthermore, Corby discloses viewing the weld puddle and using visual signals as "feedback information to control the weld parameters and move the torch for centering the weld puddle over the seam" (col. 1, lines 49-53). Corby also discloses a fiber optic bundle and termination point at the opening of the torch body (col. 3, lines 36-38 and 29-30) (optic element on end of said terminal pivot ring – the last flexible articulating ring before the nozzle). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Branch and Morris with the addition of the optical signals of Corby in order to optimize the gas metal arc welding device by detecting "weld puddle characteristics and seam to puddle deviation" (Corby, Jr. et al., column 1, lines 30-37). In response to applicant's arguments against the references individually (against Branch et al. singly on pages 6-7), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413,

208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues the rejection of claims 9-10 and 16 because it fails to explain how and why Branch could be modified to be "responsive to said measuring temperature" (page 7 and 8). The examiner disagrees and reminds applicant that Berg states the fiber optic sensors to be located where near the "sensitive" portion so that the fiber optic wraps are modulated to detect an event of interest (col. 23, lines 1-3 and 12-15) (therefore, the sensors are "responsive" to heat changes). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined welding method of Branch and Morris by adding the temperature measurements of Berg in order to ensure that the assembly process does not sink too much heat leading to a poorer weld joint or too little heat damaging the optical fibers (Berg et al., column 19, lines 62-67). In response to applicant's arguments against the references individually (against Branch et al. singly on page 7), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is 571-

272-5169. The examiner can normally be reached on Monday through Friday, 9 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

reb

Jonathan Johnson
Primary Examiner
AU 1725